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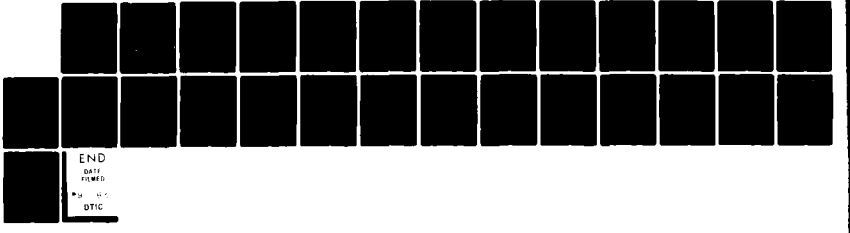

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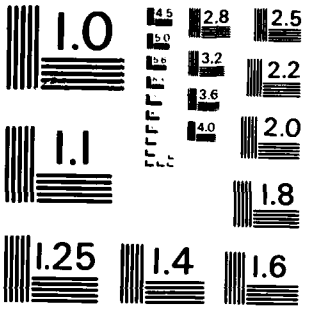

TYPE A BEHAVIOR PATTERN AND MOOD IN A STRESSFUL JOB

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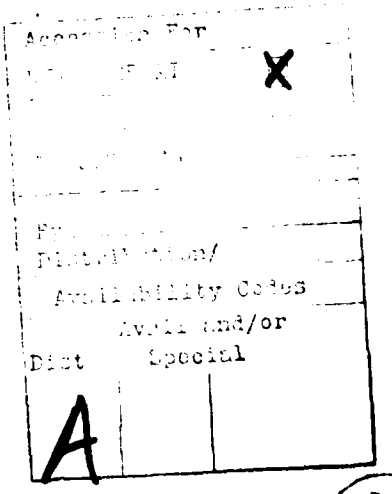

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Abstract

Affective responses to stress may play a part in the association of Type A behavior pattern (TABP) and coronary heart disease risk. The hypothesis that TABP would be related to enhanced affective reponse to stress was tested in a longitudinal study of response to work load. Affective response was considered in terms of mean level, intraindividual variability, and the intraindividual correlation of mood with work load. TABP, measured by the Jenkins Activity Survey and two other instruments, was related primarily to the mean and intra-individual correlations for anger, fatigue, and unhappiness. The data were generally consistent with clinical descriptions of TABP and underscored the importance of the interaction between the pattern and the job environment. Job Involvement was linked to lessened response and may reflect coping tendencies as implied by prior research. The data may also be consistent with hypothesized defensiveness in Type A's, but suggest a need for a more detailed development of this topic.

Type A Behavior Pattern and Mood in a Stressful Job

Type A behavior pattern (TABP), which has been linked to coronary heart disease (CHD), provides an important starting point for understanding the psychosocial aspects of a major chronic disease (Rosenman, Brand, Jenkins, et al., 1975; Jenkins, 1976). Despite this association, relatively little has been done to fully understand the psychological mechanisms involved in TABP (Cobb, 1977). The present paper examines the impact of TABP on psychological mood responses to job demands as one means of better understanding TABP dynamics.

Mood responses to work demands may be a central element of the overall TABP. Irritability, impatience, aggressiveness, and hostility are important components of TABP (Friedman & Rosenman, 1974; Rosenman, 1978). It is also known that Type A's show stronger than average physiological responses to work demands (Friedman, Rosenman & Carroll, 1958; Friedman, St. George & Byers, 1960). Affective responses to work may link work demands to physiological response (cf., Mason, 1975). Alternatively, a strong physiological response to work stress may provide the necessary arousal for some of the observed affective tendencies of Type A's (Schachter & Singer, 1962; 1979). Combining these observations, it is hypothesized that TABP will be associated with stronger affective responses to work stress.

The general TABP hypothesis must be modified for "job involvement," an element of TABP measured by the Jenkins Activity Survey (JAS: Jenkins, Rosenman & Friedman, 1967). Job involvement has consistently been negatively related to CHD risk in contrast to the positive relationships observed for other TABP

elements (cf., Zyzanski, Wrzesniewski & Jenkins, 1979). Job involvement is also positively related to coping and negatively related to defenses (Vickers, Hervig, Rahe & Rosenman, Note 1) which implies a lessened affective response to job stress (Haan, 1977). Therefore, it is hypothesized that "job involvement" will be negatively related to affective responses to work demands.

A final hypothesis concerns the combined effects of TABP elements. TABP is a syndrome comprised of a number of imperfectly correlated behaviors. Individually, these behaviors may provide less information than when they are considered as part of an overall pattern. Interactions between combinations of specific elements of TABP may be important in producing the overall impact of the pattern. For example, ego involvement has been shown to be important as a releasing factor for Type A reactions to a performance situation (Scherwitz, Berton & Leventhal, 1978). "Job involvement" may represent a comparable relationship between person and job, so high job involvement could combine with other elements of TABP to produce pronounced Type A effects, including a strong affective response to job demands. While specific evidence is apparently not available to provide a basis for generalizing this hypothesis, it does seem reasonable that, in general, interactions may occur between TABP symptoms. It is therefore hypothesized that affective responses to work demands will be greatest when two elements of TABP occur in combination.

In the present study, the three hypotheses stated above are tested in a sample of military personnel going through periods of high and low job demands (Ward, Rahe, Conway, et al., Note 2). Three parameters of mood response are

considered. Mean moods are used to represent chronic affect. General variability in mood is represented by the within-person variation in mood over a number of measurements. The specific responsiveness of mood to job demands is represented by the within-person correlation between job demands and mood.

Methods

Sample

Participants were 34 senior petty officers recently assigned to Naval Training Center, San Diego, to become recruit company commanders. These men were responsible for the training of Navy recruits, a job with established variations in levels of work load (Ward, Rahe, Conway, et al., Note 2). The average age was 33 (S.D. = 4.2) with 12.1 (S.D. = 1.1) years of education and 13.6 (S.D. = 4.4) years of active military service. Twenty-six were Caucasian, five were Black, and three were of other racial origin. Twenty-eight were married, one was separated, three were divorced, and two had never been married.

Data Collection

Data were collected on 14 days, including the first and last days of a school for company commanders and 6 training days for each of the first two companies the men trained. Work load was not measured on the first day of company commander school, so data concerning work load are based on only 13 days.

Instruments

Job demands were measured in terms of work load defined as "hours and numbers of things to do." Responses were given on a 5-point scale from "not much to do" (1) to "too much to do" (5).

Moods were measured on all study days with the Mood Questionnaire (Ryman, Biersner & La Rocco, 1974) which is comprised of 40 adjectives which produce six factor-analytically derived scales: Activity, Anger, Depression, Fatigue, Fear, and Happiness. For each adjective, respondents indicated whether they felt that way "not at all," "somewhat or slightly," or "mostly or generally" at the time of completing the questionnaire.

Type A behavior was measured using several instruments. The Jenkins Activity Survey (JAS; Jenkins, Rosenman & Friedman, 1967) was completed after the study by a subset of the men. The JAS provides measures of "AB Behavior" (JAS A-B), a scale constructed to predict ratings from the Type A interview (Jenkins, Zyzanski & Rosenman, 1971), and factor-analytically derived scales of "speed and impatience" (JAS S), "job involvement" (JAS J), and "hard-driving (JAS H) representing specific facets of TABP (Zyzanski & Jenkins, 1970).[1]

Two adjective checklist scales provided additional measures of the overall Type A pattern. The Behavior Pattern Adjective Checklist (BPAC) consisted of 20 adjectives selected from the Gough 300 Adjective Check List to maximize the correlation between the resulting scale and ratings from the standard Type A interview (cf., Rahe, Hervig, & Rosenman, 1978). A second scale consisted of the 20 items from the Thurstone Temperament Schedule Activity scale (Thurstone, 1950) with a modified response option. The Behavior Pattern Activity Scale (BPAS) has been shown to be highly correlated with the Type A interview ratings. For each

of the scales, the responses were "almost never," "sometimes," "often," and "always." These were scored from 0 to 3 with reversed scoring for items correlated negatively with the interview. Internal consistency estimates for the present sample were 0.59 and 0.66, respectively.

A final measure of Type A behavior was the Work Striving, Time Urgency, and Life Satisfaction Questionnaire developed by Romo, Siltanen, Theorell, and Rahe (1974). This instrument provided scales of "Coronary-Prone Behavior" (CPB: 5 items, Spearman-Brown reliability = 0.79) and "Life Dissatisfactions" (5 items, Spearman-Brown reliability = 0.73). The first scale reflects extreme involvement in work and the tendency to feel time urgency. The second is a measure of dissatisfaction with several aspects of one's life.

Analysis Procedures

The initial analyses computed within-person statistics for work load and moods. The mean and standard deviation for each variable were computed for each individual, after which the correlation between work load and each mood was computed for each individual. The individual's own perceptions of work load were used in this analysis. The results from these initial within-person analyses were the scores for the analyses relating affect to TABP. All analyses were performed with the Statistical Package for the Social Sciences (SPSS; Nie, Hull, Jenkins, et al., 1975.)

A large number of statistics were computed to determine the association of TABP and mood. In such a case, the probability of finding some significant associations by chance is quite high. One means of keeping the experiment-wide probability of error at an acceptable level is to increase the significance level required to establish any single result as significant. An appropriate significance level for individual statistics can be obtained by dividing the desired

experiment-wide error level by the number of significance tests performed (Dunn, 1958). The application of the Dunn-Bonferroni approach absolutely guarantees that the experiment-wide error probability is less than the initial significance level, but it is highly conservative if the individual statistics computed are intercorrelated (Lubin, Note 3). In the present case, the several moods are intercorrelated, so a compromise solution was adopted. Each mood was considered separately in each analysis. Because each mood was related to 8 Type A measures, the new significance level applying the Dunn-Bonferroni approach was $p < .00625$. Significance tests were one-tailed in keeping with the hypotheses in the Introduction.

Results

JAS scores can range from negative to positive with zero typically regarded as the point at which the individual's tendencies shift from Type B to Type A. In the present sample, there was no consistent tendency in either direction. JAS A-B scores were very close to zero ($\bar{x} = 0.79$) while scores for JAS S ($\bar{x} = -2.91$, $t = -2.02$, $p < .06$) and JAS J ($x = -.3.30$, $t = -1.93$, $p < .07$) were slightly less than zero and JAS H ($\bar{x} = 5.93$, $t = 3.28$, $p < .01$) were above zero. Type A attributes were not generally highly intercorrelated (see Table 1), although the three measures developed to predict ratings from the structured interview did tend to be positively interrelated.

Insert Table 1 about here - see pg 7a

The magnitude of the average within-person correlations between work load and moods ranged from .28 to .39 in absolute value. Using Quenouille's adjustment

TABLE 1

INTERCORRELATIONS AMONG TYPE A BEHAVIOR MEASURES

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	Coronary-Prone Behavior	—						
(2)	Life Dissatisfaction	−.12	—					
(3)	Behavior Pattern Adjective Check List	.22	.26	—				
(4)	Behavior Pattern Activity Scale	.09	−.02	.53**	—			
(5)	JAS AB	.10	.33*	.55**	.22	—		
(6)	JAS Speed and Impatience	−.23	.50**	.33*	.49*	.47*	—	
(7)	JAS Job Involvement	.36*	.02	.29	−.07	.41*	−.10	—
(8)	JAS Hard-Driving	.59**	−.22	.28	.03	.29	−.23	.27

NOTE: N = 34 for scales 1–4, and N = 27 for scales 5–8. All significance tests are based on directional hypotheses and are therefore one-tailed.

*$p < .05$

**$p < .007$ (Dunn-Bonferroni method for 7 correlates, see text.)

of degrees of freedom (Holtzman, 1963, p. 207) to take into account autocorrelation of the measures, each of these average correlations was highly significant ($p<.001$). Considering each mood separately, Hays' (1963) V statistic indicated significant interindividual variation only for Fear ($V = 50.46$, $df = 33$, $p<.05$). Therefore, the within-person correlations may be relatively insensitive indicators of individual differences in responsivity to work load if such differences exist.

For mean levels of mood, Happiness was significantly related to Life Dissatisfaction ($r = -.48$, $p<.005$) and Anger to BPAC ($r = .49$, $p<.001$) and JAS A-B ($r = .49$, $p<.005$). Associations that approached the required significance level included Happiness with CPB ($r = .41$, $p<.009$), Activity with CPB ($r = .40$, $p<.02$) and JAS J ($r = .42$, $p<.02$) and Fatigue with JAS A-B ($r = .44$, $p<.02$) and JAS J ($r = -.40$, $p<.02$).

No correlation between mood variability and TABP was significant. Those coming close to significance were Happiness with CPB ($r = .40$, $p<.01$), Fatigue with BPAS ($r = 42$, $p<.009$) and JAS J ($r = -.42$, $p<.02$) and Anger with JAS H ($r = .40$, $p<.02$).

Intraindividual correlations between mood and work load were significantly related to TABP for Anger correlations with JAS H ($r = .55$, $p<.003$) and Fatigue correlations with JAS J ($r = -.49$, $p<.005$). Other associations approaching significance were Activity correlations with JAS H ($r = -.41$, $p<.02$), Anger correlations with BPAC ($r = .42$, $p<.008$), Happiness correlations with JAS H ($r = -.42$, $p<.02$), Fear correlations with CPB ($r = .39$, $p<.02$), and Depression correlations with JAS H ($r = .42$, $p<.02$).

The hypothesis that the combined occurrence of two TABP elements would exacerbate the effects observed for isolated attributes was tested by analysis of variance. TPB, Life Dissatisfaction, BPAC, BPAS, and JAS J were selected to represent the major independent elements of TABP as measured here and maximize the sample size for this analysis. A median split defined high and low groups on each scale. All possible pairs of scales were then used for separate two-way analyses of variance. The focus of the analysis was the possible interaction between Type A elements. Hypothetically, higher levels of mean mood, variance, and intraindividual correlations to work load should have occurred among individuals with high scores on both attributes. The data did not support this hypothesis. Significant interactions were infrequent and there was no consistent pattern to the findings where interactions did occur.

Discussion

The observed associations between TABP and mood supported the hypotheses outlined in the Introduction. TABP was associated with more negative mean moods and with stronger intraindividual correlations between mood and work load. TABP tended to be associated with greater within-person variation in moods as well. As predicted, JAS J showed the reverse of this pattern. The stronger trends for within-person means and correlations than for within-person variation may have been due to lower reliability in the assessment of variability. Computation of variance depends on the squared values of the measured scores and this dependence may enhance the effect of any measurement error.

It is interesting to note that the intraindividual correlations between work load and mood could be predicted from Type A scores despite the fact that the V statistics suggested essentially chance interindividual

differences in these correlations. The predictability of these differences suggests that they were not chance and that the V statistic was a relatively insensitive measure of the differences. Overall, the data support the position that the Type A individual is more likely to experience high levels of chronic negative affect, to be more volatile in terms of mood, and to have mood variations more closely linked to work demands. The tie between work demands and mood for Type A's is particularly important because it supports the position that TABP is activated by environmental challenges. This assumption is a key part of the description of TABP (Rosenman & Chesney, 1980).

The most pronounced mood correlate of TABP was Anger with secondary associations observed for Fatigue and Happiness. Three of the five associations which met the significance criterion for this study involved Anger with one significant association each for Happiness and Fatigue. Other correlations approached significance for each of these moods.

Clinical descriptions of TABP make it reasonable that Anger was a correlate of the behavior pattern (Friedman & Rosenman, 1974; Rosenman, 1978). Type A people have also been shown to become angry and irritable in some laboratory stress studies (cf., e.g., Glass, 1977). An association to Anger also provides a reasonable hypothetical link between TABP and cardiovascular disease as Anger may be associated with patterns of physiological arousal that contribute to increased CHD risk (Henry, 1976; Henry & Stephens, 1977). Thus, an association between Anger and TABP is consistent with clinical descriptions of the pattern, prior empirical findings, and hypothetical links between TABP and CHD.

The association of TABP to Happiness and Fatigue would perhaps be less likely to be predicted from clinical descriptions of TABP. Assuming that happiness depends on goal attainment, both could follow directly from the constant striving toward relatively undefined goals that characterizes the Type A. Even so, these trends were surprising in light of reports that Type A's suppress or repress symptoms of discomfort (Carver, Coleman & Glass, 1976; Glass, 1977; Matthews & Brunson, 1979; Weidner & Matthews, 1978; Pittner & Houston, 1980). While these behavioral trends have been consistent in the studies cited, each study has been a laboratory investigation characterized by acute, possibly low level, stresses. Such settings may be inadequate to accurately assess the effects of defenses (Erickson & Pierce, 1968). Because fatigue and unhappiness can be symptoms of defensiveness (Sjoback, 1974, pp. 156-157, 164-165), the present findings may indicate general defensiveness on the part of Type A's faced with chronic real life stress.[2] The present data probably cannot be interpreted in terms of specific defenses, however. The findings may therefore be consistent with the results of the laboratory studies when allowance is made for the differences in study designs. In this connection, it is important to note that study participants successfully fulfilled their job requirements. Had they failed, their defenses might have been overcome and the pattern of affective response could have been quite different. In that case there could have been a shift to depression such as that occurring when Type A's recognize that they cannot control a situation (Glass, 1977).[3]

The results of the present study also supported the hypothesis that some elements of TABP are not necessarily maladaptive. The JAS measure of "Job

Involvement" reflects a number of characteristics that could be indicators of good overall adjustment and life success. This measure has been shown to be related to better coping and lower defense (Vickers, Hervig, Rahe & Rosenman, Note 1), both of which imply better adjustment (Haan, 1977). Further, JAS J is related to lower risk of CHD (Zyzanski, Wrzesniewski & Jenkins, 1979). The coping and defense correlates and the present data suggest that this decreased risk may follow from relative equanimity in the face of stress associated with strong coping skills and low defensiveness. The differences between JAS J and the other elements of the TABP clearly underscore the need for research designs which employ a detailed analysis of the pattern to explore its dynamics.

The final hypothesis tested was that combinations of TABP elements would exacerbate the effects of the isolated elements. This was not supported by the data, but considering the small size of the sample and the relatively crude test of hypothesis, the results are not conclusive.

The overall significance of the findings in this study lies in three areas. First, major expectations concerning the psychological elements of TABP were confirmed in a real work setting. Second, the data provide a basis for suggesting that future TABP research should include measures of multiple moods to clearly delineate the mood effects of stress in Type A's. Third, detailed attention should be given to individual elements of the TABP and to the interplay by which they produce the full pattern.

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2. Ward, H.W., Rahe, R.H., Conway, T.L., et al. Navy Company Commanders: Introduction to a Psychobiological Study of Stress and Adaptation. (Tech. Rep. 79-25). San Diego, CA: Naval Health Research Center, 1979.

3. Lubin, A. Letter of correspondence regarding the Dunn-Bonferroni method. San Diego, CA: Naval Health Research Center, May, 1975.

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Footnotes

[1]The authors wish to thank Dr. Stephen J. Zyzanski for his assistance in scoring the Jenkins Activity Survey.

[2]In addition to generally indicating defensiveness, fatigue and unhappiness may be specific distortions of depression. Fatigue, in particular, is an element of depressive symptomatology (e.g., Zung, 1965). Defensive transformation of depression is particularly likely in Type A's because depression implies hopelessness and helplessness (Seligman, 1975) and Type A's strive against such feelings (Glass, 1977; Rosenman, 1978). This transformation of affect would serve the dual purpose of expressing feelings while defending against critical elements of the affective reaction. This dual function is found in most defensive operations (Schafer, 1968). Because defensive transformation of affect does not correspond to denial, repression, or suppression, this interpretation implies that studies of TABP and defenses should consider other possible defenses, a principle which applies to all studies of defense (Heilbrun, 1978; Heilbrun & Schwartz, 1979). To date, the evidence linking TABP to defenses consists primarily of associations between the pattern and possible symptoms of defensiveness. Such associations should be interpreted cautiously, because the symptoms could arise from processes other than defensiveness (Matthews & Brunson, 1979; Weidner & Matthews, 1978). Studies correlating TABP directly to measures of defenses have shown weak associations (Pittner & Houston, 1980; Vickers, Hervig, Rahe & Rosenman, Note 1). Intensive direct investigation of the possible defensive and coping tendencies of Type A's would appear to be in order. Because both TABP and defenses are theoretically linked to stress responses, the general independence of these two elements of behavior would make studying their interaction important.

[3]Glass (1977) has described Type A's as defensively refusing to recognize the absence of control in objectively uncontrollable situations. When Type A's finally acknowledge uncontrollability, marked affective and physiological reactions may follow. As noted previously, a defensive interpretation of such a pattern must be made cautiously. However, a similar pattern of defensive resistance followed by strong affective and physiological responses when confronting loss has been noted in clinical studies where defensive processes were observed in more detail (Bunney, Hartmann & Mason, 1965; Sachar, Mackenzie, Binstock & Mack, 1967). The similarity of the response patterns would seem to increase the justification for asserting that the observed Type A response to loss of control is defensive in nature. The clinical studies do not spell out in detail the defensive patterns, but the more extended and intensive observation in these studies should provide an adequate basis for inferring that defensiveness is truly a critical element of the response pattern.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Clinical descriptions and prior research indicate that Type A individuals show stronger affective responses to stress than Type B's. These affective responses may be an important link between Type A behavior pattern (TABP) and coronary heart disease, so the association of mood and TABP was investigated in a sample of men in a job with clear variations in work demands. Perceptions of work load and six moods (anger, happiness, fear, depression, activity, and fatigue) were measured repeatedly. Mood responses were represented by the

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20. Abstract (continued)

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